whole apparatus is covered with a wooden box, removed in the illustration. This cover turns on the hinges at *c*, and, when closed, rests in the grooves *f*. The tubes *r* and *r'* are furnished with two cloth-lined metal collars, which can be pressed up against the box where the tubes pass through it. The outer end of *r* is closed with a plate in which there are three round holes side by side in a horizontal line. Before this plate is the diaphragm *d*, which can be turned on a vertical axis, and through which there is one hole. With this diaphragm the central opening in the end of *r* may be alone left open. In front is placed a kerosene lamp. From the flame of this lamp a fine pencil of rays passes through the hole in *d*, along the tubes *r* and *r'*, and is reflected by a total reflecting-prism, *p*, which throws it on the mirror, *G*, of the galvanometer, which is connected in circuit with the line by the wires *z*. From the mirror *G* the light is reflected back through the lens *l*, which brings the rays to a focus on the photographic plate. This plate is put in a holder, *k*, in the slide *S*, before the beginning of the observation. There are spring clamps on *S*, so that, when the cover is drawn from in front of the plate, the holder will remain in *S*. In order that it may be possible to expose the plate after the box-cover is put down, there is a slit covered with rubber cloth in the box, through which the fingers may reach the top of the plate-holder and pull out the sliding front. The slide *S* travels on guides *F*, and on one side is furnished with two rollers, and on the other with one; so that the movement may be as straight as the guide against which the two rollers press. In the front side of *F* there is a horizontal slit at the height of the focus of the rays. The back side of *S* carries a rack which fits a pinion on the driving-axis of the clock *U*. The downward movement of *S* is therefore regulated by this clock, of which it forms the driving-weight. The downward velocity is about 80 mm. per hour. This is sufficient to allow of changes from minute to minute being easily distinguished. For the purpose of allowing different rates of speed, it is proposed to put another rack on the back of *S*, which, by a sliding motion, may be made to catch on a second pinion of different size.

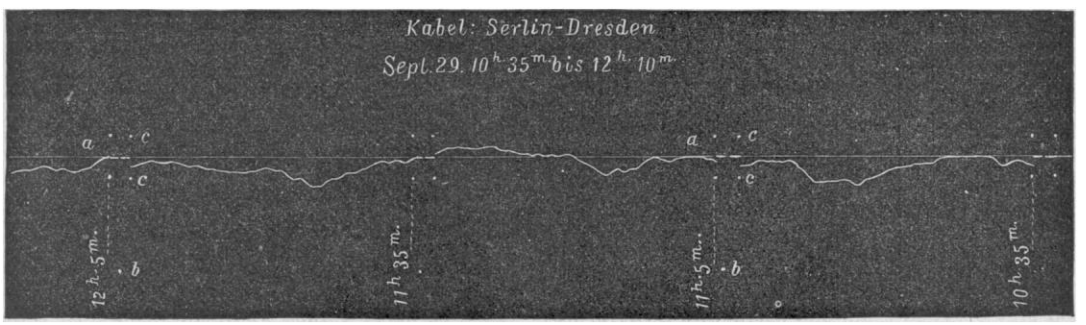

FIG. 2.

For lesser changes the pendulum may be varied in length.

The wires leading to the galvanometer are connected with a commutator. When the needle is in its position of rest, a straight line will be marked on the plate by an upward movement of the slide. From this line the deflections caused when the earth-currents pass are measured. Time-signals may be made by turning back the diaphragm *d*, when marks will be made on each side of the neutral line. From time to time, currents of known strength may be sent through the apparatus, and will produce spots, as *b*.

Fig. 2 shows one of the diagrams obtained. The abscissa line was drawn through the portions *a*, which were marked by the light. The portions *a* are broken, and at these points occur the dots *b*, the result of the known currents. *c*, *c* are the time-signals.

A NEW CONDENSING-HYGROMETER.

EVERY one who has had occasion to use the common form of condensing-hygrometer for the determination of the dew-point of the air, as devised by Regnault, has found great difficulty in obtaining satisfactory results, especially if the air is in rapid motion, and there is a great difference between the dew-point and the air-temperature.

Professor Crova of Montpellier, France, recognizing these defects, has devised a new form of this apparatus which obviates many of the difficulties, and goes far toward making this justly important instrument one of precision.

The principle adopted is that of condensing moisture upon the *inside* of a polished cylinder the outside of which has been cooled. This instrument described in the *Journal de physique*, April, 1883, consists essentially of a brass cylinder, nickel plated, and highly polished on the inside, provided with two fine tubes near its ends. Through one of these, by means of a rubber tube conducted to the exterior air or to any point at which it is desired to obtain the hygrometric state, the air is drawn into the polished cylinder by using an aspirating-bulb attached to the other. At the first extremity is placed a ground-glass plate, which permits light to enter. This light appears as a bright annulus enlarged three times, as viewed by a magnifier at the other end.

The cylinder is supported in a box, through the centre of which it passes horizontally. This box is provided with two openings, as in an ordinary condensing-hygrometer, through which, by aspiration or by blowing, ether contained in the box may be evaporated, thus lowering the temperature, which is indicated by a properly adjusted thermometer.

In observing, air is drawn into the cylinder by an aspirating-bulb, and at the same time the ether is evaporated. The moment dew appears on the inside of the cylinder, which is easily seen, the reading of the thermometer gives the dew-point. This may be readily obtained again and again with an error less than 0.1° C., or 0.18° F.

Some of the advantages claimed, are the possibility of guarding against varying air-currents; the delicacy of adjustment; the ease and accuracy of observation with the magnifier; the easy manipulation of a uniform light, so difficult to obtain in the ordinary form; and the use of the apparatus in the house for determining the dew-point of the outer air.

In regard to the last advantage claimed, it may be said, that if accurate results can thus be obtained when the air-temperature is from — 40° to — 60°, or when there is a difference of forty or more degrees between the air-temperature and the dew-point, the instrument will be of great service; but there should be some means of aspirating the outside air through the ether, and the apparatus should be very carefully isolated by non-conductors of heat, as the heat of the room would make a sufficient cooling impossible under the conditions just named. The possibility of easily securing such isolation without interfering with the working of the apparatus seems the most important advantage to be derived from its use.

H. A. Hazen.

THE RIGHT WHALE OF THE NORTH ATLANTIC.

The four plates devoted in Dr. Holder's recent paper on this subject[1] to the external and osteological characters of the right whale of the North Atlantic (Balaena cisarctica Cope = B. biscayensis of European cetologists), and the seventeen pages of text descriptive of the same, form a welcome and valuable contribution to the history of a species possessing peculiar interest. Its habitat being the temperate waters of the North Atlantic, — extending from the coast of Florida and the Bay of Biscay, northward to southern Labrador and Iceland, — it was pursued off the coast of Europe for centuries before the Greenland whale (B. mysticetus), the basis of the great northern whaling industry of modern times, became known to Europeans. It was hunted by the Basques and Norwegians as early as the ninth and tenth centuries, was the basis of the whale-fishery of the fifteenth and sixteenth centuries, and was already approaching extinction in European waters, when the great arctic or Greenland whale first attracted the attention of whalers, early in the seventeenth century. The latter, from its greater size, easier capture, and larger numbers, its greater yield of oil and superior quality of baleen, became at once the chief object of pursuit; and the earlier known species was quickly lost sight of as a commercial animal, except on this side of the Atlantic. Here it was the species chiefly hunted by American whalemen down to about the middle of the last century, when from its rarity its pursuit was gradually abandoned for that of the arctic species. The cisarctic animal was early known to the French as the 'sarde;' to the Norwegians, Dutch, and Germans, as the 'nordkaper;' and to the Icelanders as the 'sletbag.' To Americans it was known under the various names of 'northcaper,' 'Grand Bay whale' (in reference to the Bay or Gulf of St. Lawrence, where it was chiefly hunted), 'seven-foot-bone whale,' and 'black whale.' Under these names it was briefly described by various early non-scientific writers, and, in the works of the early systematists, was very inadequately characterized under various systematic names. It is the Balaena glacialis of Klein (1741) and Bonnaterre (1789), the B. islandica of Brisson (1756), and the B. nordcaper of Lacépède (1804). It was, however, practically unknown to science, till the researches of Eschricht and Reinhardt, published in 1861, led to its rediscovery, having been, until then, generally confounded with the B. mysticetus. During recent years it has several times been taken off the coast of southern Europe and in the Mediterranean. These specimens have formed the basis of important memoirs, and given rise to additional specific names. It is, however, now commonly known in Europe as Balaena biscayensis, the name originating really with Gray, although almost universally ascribed to Eschricht, who merely designated the species by an equivalent vernacular name. It was redescribed by Cope in 1865 as B. cisarctica, from a specimen taken at Philadelphia, the skeleton of which is now in the museum of the Philadelphia academy of natural sciences. Ruling out the name 'islandica' of Brisson, on the ground that it antedates the binomial system, and 'glacialis' of Bonnaterre as untenable from its misleading tenor, we have left, of the earlier names, 'nordcaper' of Lacépède, which is objectionable only from its barbarous character, but no more so than hundreds of other names currently employed in zoölogy, save by a few purists who admit nothing that is unclassical.

Dr. Holder describes and figures, 1°. The external characters of a male specimen taken off the New-Jersey coast in the spring of 1882; 2°. The skeleton of a specimen (sex unknown) stranded some years since on Long Island; 3°. Through notes furnished by Dr. G. E. Manigault, a specimen captured in the harbor of Charleston, S.C., in January, 1880. Professor Cope's specimen, and two of the three here mentioned, are more or less immature. There is, however, the skeleton of a fully adult example, taken at Provincetown in 1865, in the Museum of comparative zoölogy, of which, as yet, no description has been published. The New-Jersey example not having been preserved, there exist at present four skeletons of this species in American museums. Dr. Holder figures the skull of the Charleston, the external characters of the New-Jersey, and the

[1] *Bull. Amer. mus. nat. hist.*, vol. i. no. 4, pp. 99–137, pl. x.–xiii., May 1, 1883.